



National Transportation Safety Board Aviation Accident Final Report

Location:	OCALA, FL	Accident Number:	MIA96FA049
Date & Time:	12/26/1995, 2245 EST	Registration:	N800SJ
Aircraft:	Piper PA-46-310P	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 Serious, 5 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

During cruise flight at 14,000 feet mean sea level, the engine failed. The flight was vectored to a nearby airport but the pilot flew toward another airport and crashed in a residential area. Examination of the engine revealed 1.8 quarts of oil were drained and 3 of the 6 connecting rods were failed due to lack of lubrication. Also, detonation damage to the No. 6 cylinder piston was noted and scoring of piston sidewalls was noted at 5 of the 6 cylinders. Evidence of heat discoloration was noted to the connecting rod journals for 3 of the 6 cylinders. The aircraft TIT gauge, which had been miscalibrated by 30 to 40 degrees when the airplane was manufactured, was found to indicate 110 degrees Fahrenheit low near the maximum continuous point of 1,750 degrees. The air/oil separator hose to the scavenge pump was plugged about 10 inches along its length with a substance with a high lead content resulting in the recurring pilot report of excessive oil consumption. Due to the pilot complaint of excessive oil consumption 4 of the 6 cylinders were removed and replaced within the previous 6 months. About 1 month before the accident one of the cylinder pistons was removed and replaced after examination revealed piston sidewall damage consistent with detonation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: oil starvation resulting in connecting rod failure in three of the six cylinders due to lack of lubrication. Contributing to the accident was the failure of the pilot to adhere to a ATC vector toward the nearest airport following engine failure which resulted in the airplane flying past the vectored airport and subsequent collision with trees.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF

Phase of Operation: CRUISE - NORMAL

Findings

1. ENGINE INSTRUMENTS,TIT GAGE - FALSE INDICATION
2. MAINTENANCE,CALIBRATION - IMPROPER - MANUFACTURER
3. MAINTENANCE,CALIBRATION - NOT PERFORMED - OTHER MAINTENANCE PERSONNEL
4. ENGINE ASSEMBLY,PISTON - SCORED
5. (C) FLUID,OIL - STARVATION
6. (C) ENGINE ASSEMBLY,CONNECTING ROD - FAILURE,TOTAL

Occurrence #2: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

7. OBJECT - TREE(S)
8. (F) ATC CLEARANCE - DISREGARDED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On December 26, 1995, about 2245 eastern standard time, a Piper PA-46-310P, N800SJ, registered to Scott Gold Company, Inc., was substantially damaged during a forced landing near Ocala, Florida. Visual meteorological conditions prevailed at the time and an IFR flight plan was filed for the 14 CFR Part 91 personal flight. The private-rated pilot and one passenger sustained serious injuries. The remaining five passengers were not injured. The flight originated about 2210 from the Kissimmee Municipal Airport, Kissimmee, Florida.

The pilot stated that shortly after leveling off at 14,000 feet while in contact with the Jacksonville, FL, Air Route Traffic Control Center, he observed that the manifold pressure decreased and the low oil pressure annunciator light illuminated. He advised the controller of the loss of oil pressure and at that time the airplane was 13.8 nautical miles and 348 degrees to the Ocala Regional/Jim Taylor Field airport. The engine then seized and the controller suggested a heading of 350 degrees to fly toward the Ocala airport. The pilot acknowledged the heading then advised the controller that an airport beacon was in sight. The flight was observed on radar to turn away from the vectored heading flying east of and past the Ocala airport. While descending, the airplane collided with trees then the ground and the airplane came to rest upright on a magnetic heading of about 170 degrees in the front yard of a home. The crash site was located about 8 nautical miles northeast of the Ocala airport and .78 nautical mile due south of a private airstrip that has a beacon. The Ocala airport beacon was operational the night of the accident.

ENGINE EXAMINATION

Cursory examination of the engine the following day by an FAA airworthiness inspector revealed oil in the engine compartment area and a hole in the crankcase opposite to the No. 3 cylinder. The engine was removed for further examination under the guidance of the FAA, and representatives of the engine and airframe manufacturer. Two FAA inspector statements pertaining to the engine examination are attachments to this report. All fuel injector nozzles, the fuel manifold valve assembly, and engine driven fuel pump were bench tested the results of which are also attachments to this report. The No. 6 cylinder piston which exhibited evidence of detonation had accumulated about 30 hours since installation. Additionally, the air/oil separator was found to contain about 1/2 cup of oil. The hose from the outlet of the separator to the inlet of the scavenge pump was plugged about 10 inches of its length with a material with a high lead content.

AIRCRAFT INFORMATION

The airplane was equipped with a Graphic Engine Monitor (GEM) which has a probe for the T.I.T., and a probe in each cylinder for cylinder head temperature and a probe in each exhaust for exhaust gas temperature.

Review of the engine logbook and work orders revealed that the engine received a major overhaul on December 16, 1988, following reported sudden stoppage. The cylinders were repaired and pistons and piston rings installed. The first entry regarding cylinder replacement was dated January 11, 1991, in which the No. 3 cylinder was removed for low compression. An entry dated May 6, 1993, indicates a factory technical representative states "...low compression to be normal for this particular engine.." On November 23, 1994, the No. 3 cylinder was

removed and reinstalled due to low differential compression due to "stuck" No. 2 compression and oil control rings. Also, the aluminum piston pin plug was failed. The owner complaint was recorded as high oil consumption and the cylinder had accumulated about 561.4 hours since installation. On June 6, 1995, a maintenance entry indicated that cylinder Nos. 1, 2, and 6 were removed, repaired and replaced due to owner report of high oil consumption. The cylinders had accumulated about 1,004 hours since installation.

On November 23, 1995, during a 100-hour inspection of the engine, low compression was noted in the No. 4 cylinder. Removal of the cylinder revealed exhaust valve to piston contact and the pushrod was bent. Scoring was noted along the sides of the piston but the mechanic stated that there was no damage to the piston ring lands. The No. 5 cylinder was also removed and the aluminum piston pin plug was failed. The cylinders had accumulated about 1,030 hours since installation. The November 1994, and June 1995, work was performed by AMR Combs-Birmingham, Alabama. The November 1995, work was performed by Custom Aircraft Works, Sylacauga, Alabama.

Review of the aircraft logbooks revealed that the turbine inlet temperature (T.I.T.) probe was replaced on three occasions, the latest occurred on July 20, 1994, when the T.I.T. probe for the GEM was specifically identified as being replaced. Additionally, the records indicate that the EGT and CHT probe for the GEM were replaced. There was no entry in the aircraft logbooks which indicates specifically that the T.I.T. gauge was removed and checked for calibration.

ADDITIONAL DATA/INFORMATION

Additionally during the post accident investigation the T.I.T. gauge was found to indicate 110 degrees low at test points 1700 and 1800 degrees Fahrenheit. Also the CHT portion of the combination oil/cylinder head temperature (CHT)/oil pressure gauge was found to indicate 5 degrees Fahrenheit low at test points 400 and 500 degrees Fahrenheit. The oil temperature gauge was found to indicate correct at 4 of the 5 test points including at 250 degrees Fahrenheit.

According to the pilot's operating handbook and FAA approved airplane flight manual, the maximum continuous turbine inlet temperature is 1,750 degrees Fahrenheit. Also, the maximum CHT and oil temperature limits are 460 and 240 degrees Fahrenheit. The pilot's operating handbook indicates that the T.I.T. gauge is the reference instrument for final adjustment of the fuel/air ratio.

The T.I.T. gauge was manufactured in 1986, and had not been returned to the manufacturers facility. Additionally, the initial gauge test procedure by the manufacturer, date unknown, did not require the use of 8 ohm resistance. A revised gauge test procedure dated May 13, 1985, required the use of 8 ohm resistance connected to the positive terminal to simulate the total resistance of the airplane's electrical wiring from probe to the gauge plus the resistance of the probe.

According to The New Piper Aircraft Company personnel, the May 1985 revision to the gauge calibration procedure was not incorporated into production of any Piper PA-46 series aircraft until April 25, 1995. The accident airplane was manufactured in 1986. The revised test procedure was incorporated into the airplane maintenance manual on July 8, 1988.

According to the FAA Advisory Circular AC65-12A, detonation is indicated in part by eroded portions of pistons and a rich mixture will not detonate as readily as a lean mixture.

Pilot Information

Certificate:	Private	Age:	44, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	12/18/1995
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	1500 hours (Total, all aircraft), 500 hours (Total, this make and model), 2 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N800SJ
Model/Series:	PA-46-310P PA-46-310P	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	46-8608062
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	11/23/1995, Annual	Certified Max Gross Wt.:	4100 lbs
Time Since Last Inspection:	6 Hours	Engines:	1 Reciprocating
Airframe Total Time:	1540 Hours	Engine Manufacturer:	Continental
ELT:	Installed	Engine Model/Series:	TSIO-520-BE
Registered Owner:	SCOTT GOLD COMPANY, INC.	Rated Power:	310 hp
Operator:	WILLIAM E. SCOTT	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	OCF, 90 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	2315 EST	Direction from Accident Site:	227°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	350°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	1° C / -1° C
Precipitation and Obscuration:			
Departure Point:	KISSIMMEE, FL (ISM)	Type of Flight Plan Filed:	IFR
Destination:	BIRMINGHAM, AL (BHM)	Type of Clearance:	IFR
Departure Time:	2210 EST	Type of Airspace:	Class G

Airport Information

Airport:	OCALA REGIONAL/JIM TAYLOR (OCF)	Runway Surface Type:	
Airport Elevation:		Runway Surface Condition:	
Runway Used:	0	IFR Approach:	
Runway Length/Width:		VFR Approach/Landing:	Forced Landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	1 Serious, 5 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious, 5 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	TIMOTHY W MONVILLE	Report Date:	04/15/1998
Additional Participating Persons:	SUSAN MEADOWS; ORLANDO, FL DALE CARTER; MARIETTA, GA PAUL LEHMAN; VERO BEACH, FL		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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